

Virtual Reality Mindfulness Meditation to Improve Patient-Reported Outcomes Following Anterior Cruciate Ligament Reconstruction: A Case Report

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PURPOSE

- Fear of reinjury is a significant concern for athletes in recovery from anterior cruciate ligament reconstruction (ACLR). Athletes returning to sport within two years post-surgery face a 13% increase in the likelihood of requiring a second ACLR within 24 months of return to sport.
- To examine the efficacy of virtual reality mindfulness meditation (VRMM) in modifying patient-reported outcomes (PROs) of fear of reinjury, psychological readiness to return to sport, fear-avoidance beliefs, and knee-related symptoms and pain in a patient with a history of ACLR.

METHODS

1. A 22-year-old female with a history of ACLR (10.8 months post-operation) completed an 8-week VRMM intervention 3 times per week for 24 sessions total.
2. Participant completed the Tampa Scale for Kinesiophobia (TSK-11), the Anterior Cruciate Ligament-Return to Sport after Injury (ACL-RSI), the Fear-Avoidance Beliefs Questionnaire (FABQ), the Knee Injury and Osteoarthritis Outcome Score for Symptoms (KOOS-S) and Pain (KOOS-P) pre- and post-intervention.
3. Pre- and post-VRMM change scores were calculated to assess clinically significant improvements in PROs per each questionnaire's Minimal Detectable Change (MDC) value or Minimal Clinically Important Differences (MCID) value.



Figure 1. Virtual Reality Headset

The patient reported **clinically significant improvements** for all outcome measures with the implementation of **VRMM post-ACLR.**



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RESULTS

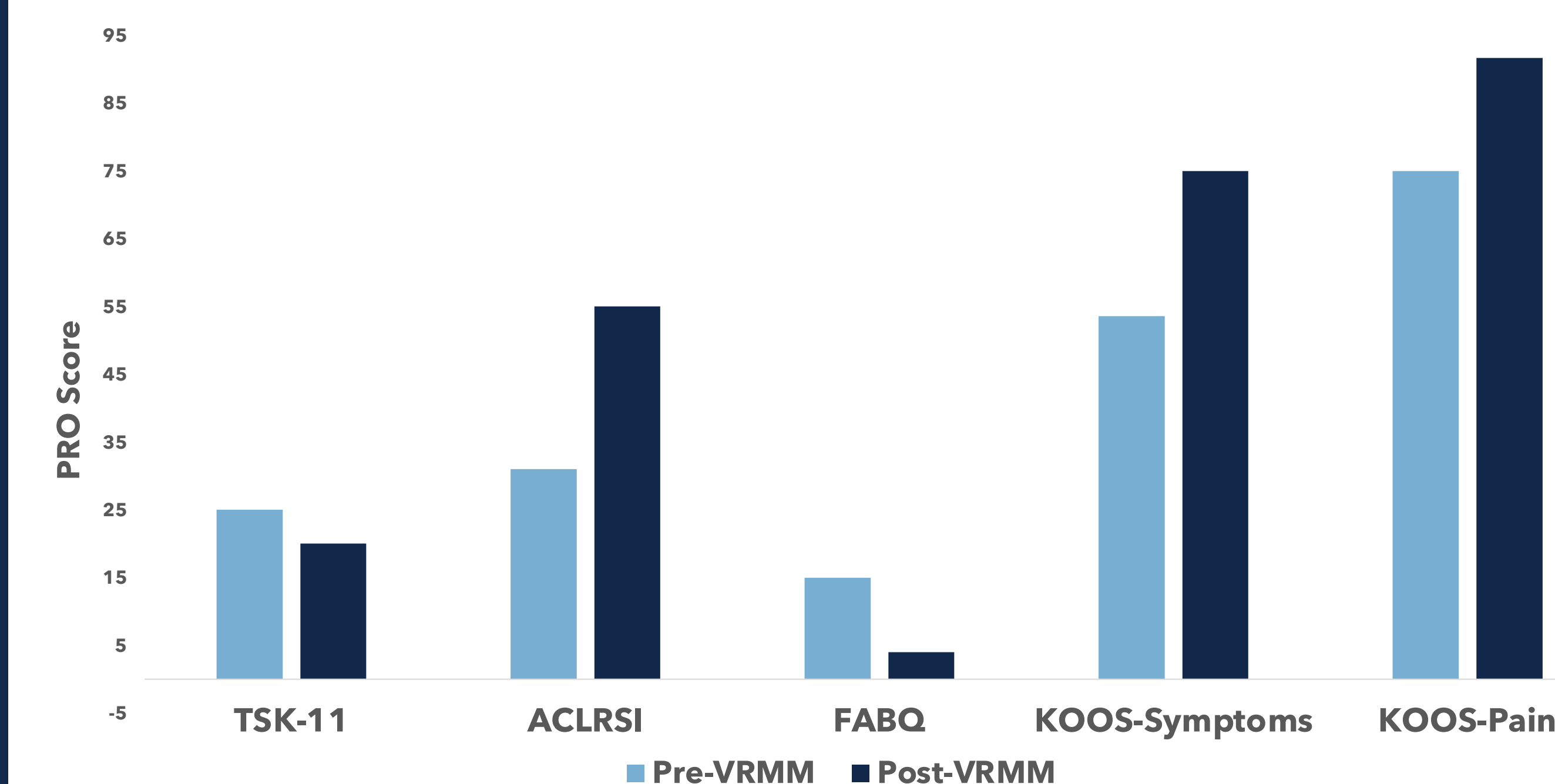


Figure 2. PRO scores completed Pre- and Post-8-week VRMM intervention. Improvement in scores represented by decrease in TSK-11 and FABQ and increase in ACL-RSI, KOOS-Symptoms, and KOOS-Pain.

PRO	Pre-VRMM	Post-VRMM	Difference (Pre-Post)	MDC	MCID
TSK-11	25	20	5	-	4.8
ACLRSI	31	55	-24	12.85	-
FABQ	15	4	11	7.95	-
KOOS-S (symptoms)	53.57	75	-21.43	5 - 8.5	-
KOOS-P (pain)	75	91.67	-16.67	6-6.1	-

Table 1. Pre and Post-8-week VRMM PRO change scores were calculated and compared to MDC or MCID values.

DISCUSSION

- The patient reported clinically significant improvements for all PROs, suggesting that VRMM may effectively mitigate poor patient outcomes post-ACLR.
- These findings underscore the potential of VRMM as a valuable adjunct therapy in the rehabilitation process post-ACLR.

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